

WHAT IS CLAIMED IS:

1. A friction clutch assembly for connecting driving and driven shafts, comprising:  
a pressure plate adapted for operative attachment to said driven shaft for rotation  
therewith, the pressure plate being axially moveable between an engaged position wherein  
the pressure plate applies a force to clamp a friction disk of said driven shaft in operative  
engagement with a flywheel of said driving shaft thereby to transmit torque from the  
driving shaft to the driven shaft and a disengaged position wherein the pressure plate does  
not clamp said friction disk and substantially no torque is transmitted,

a cover adapted for mounting on the flywheel in a fixed axial position relative to  
the flywheel and for conjoint rotation with the flywheel,

at least one spring adapted for mounting to the cover and in contact with the  
pressure plate whereby the spring urges the pressure plate into the engaged position and  
compression of said spring releases pressure on said pressure plate allowing for movement  
of said pressure plate to the disengaged position,

at least one lever assembly comprising a cartridge adapted for mounting on said  
cover, a lever pivotable in the cartridge to contact said pressure plate and apply an axial  
force urging the pressure plate to the engaged position, and a lever assembly spring  
associated with said cartridge to bias against the pivoting movement of the lever and delay  
the pivoting movement of the lever until the clutch assembly reaches a predetermined  
rotational speed.

2. The clutch assembly as set forth in claim 1 wherein said assembly is a truck  
clutch assembly.

3. The clutch assembly as set forth in claim 1 wherein there are plural lever  
assemblies, said lever assemblies being spaced at different radial distances from a center of  
the cover and configured for incremental application of said axial force at increasing  
rotational speeds of the assembly.

4. The clutch assembly as set forth in claim 3 wherein said plural lever assemblies comprise three lever assemblies.

5. The clutch assembly as set forth in claim 1 wherein said lever assembly is configured to restrain the lever from urging said pressure plate to the engaged position until the rotational speed of the assembly is at least approximately 2000 RPM.

6. The clutch assembly as set forth in claim 1 wherein said cartridge comprises at least one stop disposed for contact with said lever to limit the pivoting movement of the lever.

7. The clutch assembly as set forth in claim 1 wherein said lever assembly spring comprises a plate spring.

8. The clutch assembly as set forth in claim 1 wherein said lever assembly spring has generally an hourglass shape.

9. A friction clutch assembly for connecting driving and driven shafts, comprising:  
a pressure plate adapted for operative attachment to said driven shaft for rotation therewith, the pressure plate being axially moveable between an engaged position wherein the pressure plate applies a force to clamp a friction disk of said driven shaft in operative engagement with a flywheel of said driving shaft thereby to transmit torque from the driving shaft to the driven shaft and a disengaged position wherein the pressure plate does not clamp said friction disk and substantially no torque is transmitted,

a cover adapted for mounting on the flywheel in a fixed axial position relative to the flywheel and for conjoint rotation with the flywheel,

at least one spring adapted for mounting to the cover and in contact with the pressure plate whereby the spring urges the pressure plate into the engaged position and

compression of said spring releases pressure on said pressure plate allowing for movement of said pressure plate to the disengaged position,

15 a plurality of lever assemblies adapted for mounting on said cover, said lever assemblies comprising a lever pivotable relative to the cover and configured to apply an axial force urging the pressure plate to the engaged position, said lever assemblies being spaced at different radial distances from the center of the cover for incremental application of said axial force at increasing rotational speeds of the assembly.

10. The clutch assembly as set forth in claim 9 wherein said assembly is a truck clutch assembly.

11. The clutch assembly as set forth in claim 9 wherein said plurality of lever assemblies comprises three lever assemblies each lever assembly applying a different amount of force at a respective rotational speed of the assembly.

12. The clutch assembly as set forth in claim 9 wherein each lever assembly further comprises a cartridge adapted for mounting to said cover, wherein said lever is adapted for mounting to said cartridge.

13. The clutch assembly as set forth in claim 12 wherein said cartridge comprises at least one stop for contact with said lever to limit the pivoting movement of the lever.

14. The clutch assembly as set forth in claim 9 wherein each lever assembly further comprises a spring adapted for mounting to said cartridge to provide resistance to pivotal movement of the lever.

15. The clutch assembly as set forth in claim 9 wherein said lever is configured for pivotal contact with the pressure plate to apply said axial force to the pressure plate.

16. The clutch assembly as set forth in claim 9 wherein said lever is configured for pivotal contact with the spring to apply said axial force to the pressure plate.

17. A method of converting a clutch having at least one spring mounted on a clutch cover into a centrifugally assisted clutch, the method comprising the steps of:  
providing at least one centrifugal lever housing including a lever pivotable in the housing for applying a force to a pressure plate of the clutch;  
5 forming an opening for the lever in the cover of the clutch;  
inserting the lever in the opening; and  
securing the housing to the cover.

18. The method of claim 17 wherein said providing at least one lever housing step comprises providing three lever housings.

19. The method of claim 17 wherein said at least one lever housing comprises a cartridge.

20. The method of claim 19 wherein said securing the housing step comprises welding the cartridge to the cover.

21. The method of claim 17 further comprising forming an opening in the spring for the lever.

22. The method of claim 21 further comprising securing a contact pad to the pressure plate of the clutch and aligning the contact pad for contact with the lever.

23. The method of claim 22 wherein said securing the contact pad step comprises welding a contact pad to an upper face of the pressure plate of the clutch.

24. The method of claim 17 wherein said at least one lever housing comprises a mounting bracket.

25. The method of claim 24 wherein said securing the housing step comprises welding the bracket to the cover.

26. The method of claim 17 wherein inserting the lever step comprises aligning the lever for contact with the spring.

27. A centrifugal lever assembly for a clutch comprising:  
a housing sized and shaped for mounting on a clutch cover;  
a lever pivotably mounted on the housing to apply a force in response to rotation of the clutch cover to a pressure plate of a clutch.

28. The centrifugal lever assembly set forth in claim 27 wherein said housing is a cartridge mounted on the clutch cover.

29. The centrifugal lever assembly set forth in claim 28 further comprising a spring attached to the cartridge and positioned for engagement with the lever.

30. The centrifugal lever assembly set forth in claim 29 wherein said lever comprises a head protruding from the cartridge, a heel for applying an axial force to the pressure plate of the clutch, and a toe for engaging the spring.

31. The centrifugal lever assembly set forth in claim 30 wherein said lever is pivotable relative to the cover and configured for contact with the pressure plate to apply said axial force to the pressure plate.

32. The centrifugal lever assembly set forth in claim 30 wherein said heel has a radius of curvature of approximately 0.25 inches.

33. The centrifugal lever assembly set forth in claim 29 wherein said cartridge comprises a rear chamber for receiving the lever and a base for receiving the spring.

34. The centrifugal lever assembly set forth in claim 33 wherein said cartridge comprises at least one stop for contacting said lever to limit the pivoting movement of the lever.

35. The centrifugal lever assembly set forth in claim 34 wherein said at least one stop comprises a first stop on the base of the cartridge and a second stop in the rear chamber of the cartridge.

36. The centrifugal lever assembly set forth in claim 27 wherein said housing comprises a mounting bracket.

37. The centrifugal lever assembly set forth in claim 36 wherein said lever comprises a head disposed at least partially inside said clutch cover and a base disposed at least partially outside of said clutch cover.

38. The centrifugal lever assembly set forth in claim 37 wherein said head is in contact with a diaphragm spring of said clutch to apply said axial force to the pressure plate.

39. The centrifugal lever assembly set forth in claim 38 wherein said head comprises a roller in contact with said diaphragm spring.

40. A friction clutch assembly for connecting driving and driven shafts, comprising:

5 a pressure plate adapted for operative attachment to said driven shaft for rotation therewith, the pressure plate being axially moveable between an engaged position wherein the pressure plate applies a force to clamp a friction disk of said driven shaft in operative engagement with a flywheel of said driving shaft thereby to transmit torque from the driving shaft to the driven shaft and a disengaged position wherein the pressure plate does not clamp said friction disk and substantially no torque is transmitted,

10 a cover adapted for mounting on the flywheel in a fixed axial position relative to the flywheel and for conjoint rotation with the flywheel,

at least one spring adapted for mounting to the cover and in contact with the pressure plate whereby the spring urges the pressure plate into the engaged position and compression of said spring releases pressure on said pressure plate allowing for movement of said pressure plate to the disengaged position,

15 at least one lever assembly adapted for mounting on said cover, said lever assembly comprising a lever pivotable relative to the cover and configured for contact with said at least one spring to apply an axial force urging the pressure plate to the engaged position.

41. The clutch assembly as set forth in claim 40 wherein said assembly is a truck clutch assembly.

42. The clutch assembly as set forth in claim 40 wherein said lever assembly comprises a bracket mounted on said cover.

43. The clutch assembly as set forth in claim 40 wherein said spring is a diaphragm spring.

44. The clutch assembly set forth in claim 43 wherein said lever comprises a head at least partially inside said clutch cover and a base at least partially outside of said clutch cover.

45. The centrifugal lever assembly set forth in claim 44 wherein said head is in contact with the diaphragm spring of said clutch to apply said axial force to the pressure plate.

46. The centrifugal lever assembly set forth in claim 45 wherein said head comprises a roller in contact with an annular outer portion of the diaphragm spring.